

Tebb, Thudichum (p. 187), Strecker (p. 188), Zeisel (pp. 219-221) are all spelt more or less inaccurately. We do not for a moment suggest that such trivial errors in typography constitute a serious blemish on an admirable work; we mention them rather in illustration of what we believe to be a national peculiarity. Chemical errors seem nearly all to have been collected in a list of errata, but the structural formulæ of quinine (p. 37) and of tryptaflavine (p. 109) still require revision. It is perhaps open to discussion whether quinotoxine (p. 39) can be strictly described as the ketone corresponding to quinine, and whether, in French, phenyl potassium sulphate (p. 236) should really be an "éther sulfonique" (but here we may be getting on dangerous ground).

Prof. Fourneau's book should find a place wherever organic chemistry is taught to advanced students. It may be warmly recommended to the pharmacologist as a source of information on the chemistry of his subject. To recommend to technical chemists a book by the former director of the Poulenc laboratories seems superfluous.

GEORGE BARGER.

The Hegelian Method and Modern Science.

The Ethical Theory of Hegel: A Study of the Philosophy of Right. By Prof. H. A. Reyburn. Pp. xx+271. (Oxford: Clarendon Press, 1921.) 8s. 6d. net.

THE "Rechtsphilosophie" was the last of the works published by Hegel in his lifetime. Originally it consisted of the rigorous, consecutively demonstrated, chain of numbered paragraphs, which he used as the framework of his courses of lectures. In the form in which we now know it in the collected edition published in 1833 two years after his death, the editors have added the notes and emendations, the celebrated *Zusätze*, with which Hegel was accustomed to elucidate his theory in lecturing.

Prof. Reyburn in this admirable study which he entitles Hegel's Ethical Theory, deals mainly with the "Rechtsphilosophie" but treats it as a general introduction to the whole philosophy of Hegel. It is doubtful if for the modern student he could have chosen a better way. Hegel had no ethical theory in the technical meaning of the term. His philosophy is ethical theory and his ethical theory is his philosophy. It cannot be otherwise if we once accept the view that the real is the rational and the rational is the real. If there be no realm of existence outside of and indifferent to value there is no need for a transcendental theory of morality like Kant's or a utilitarian principle like Bentham's.

The study of Hegel is of peculiar interest at the

present time, and more especially to those who are conscious of the new methodology of science which is manifesting itself in the most modern mathematical and physical theories. So striking indeed is this that had Hegel's place in the history of philosophy been after instead of before the great scientific achievements of the end of the nineteenth and the opening of the twentieth centuries, it would have been impossible to resist the belief that the Hegelian dialectic had been suggested directly to its inventor by the discoveries of science. What finer illustration of identity in difference, of advance by negation, of the union of opposites in a higher synthesis, is to be found than that afforded by the electrical theory of matter? There have been repeated attempts since Hegel to reform philosophy by introducing into it what has been called scientific method, but the great reform which we are witnessing to-day is the introduction of philosophical method into science. Its keynote is that the concrete only is real. Science is discovering that there is no means of giving self-hood, consistency, independence, to the abstract, and this is the alpha and omega of the Hegelian philosophy.

Anyone who desires an easy introduction to the thought of this most powerful and yet most difficult philosopher of the modern period may be recommended to read Prof. Reyburn's book.

H. W. C.

Soaps and Proteins.

Soaps and Proteins: Their Colloid Chemistry in Theory and Practice. By Prof. M. H. Fischer and others. Pp. ix+272. (New York: J. Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1921.) 24s. net.

THE principal author of the volume under notice, who is a physiologist, states in his preface that he is principally interested in the colloid chemistry of the proteins, that this is too complex for direct analysis, and that therefore he turned to the soaps, as sufficiently analogous to the proteins in their colloidal behaviour to enable one "from the surer ground of the soaps . . . to step over into the more slippery one of the proteins." This view of the possibilities of reasoning by analogy will strike most people as decidedly light-hearted, even in cases where the results to be thus applied are unassailable, a condition which cannot be claimed for the author's views on the nature of soap-liquid systems.

The experimental work described consists in the preparation of a very large number of pure soaps (in the widest sense) and their examination under practically one aspect—their power to form gels with water

and other solvents. The results are used to support the author's theory of the sol-gel transformation, which, according to him, is "a change from what is, at the higher temperature, essentially a solution of *soap in water* to that which is, at the lower temperature, a solution of *water in soap*." The methods of physical chemistry are held to be inapplicable to the latter type, and the author is thus relieved of the task of considering the fundamental work of McBain and his school. Various experiments are quoted in support of this gel theory, thus (p. 80): "A drop of phenolphthalein solution dropped upon a 10 per cent. sodium stearate water gel remains uncoloured. If, however, the gel is slightly squeezed (which breaks the encircling hydrated sodium stearate film and squeezes out the enclosed solution of soap-in-water), the spot turns bright red." If any one will take the trouble to put a drop of indicator on an acid or alkaline gelatin gel, he will see it turn without squeezing, so that the behaviour of soap gels is not, as the author claims, typical or universal, nor is it any clue to that of protein gels.

The chapters on proteins are trifling, and analogies like that drawn between the heat coagulation of albumin and the behaviour of a boiled solution of sodium palmitate can scarcely be taken seriously. The author almost throughout dismisses the work of other investigators in the airiest fashion; most strikingly, perhaps, in his chapters on emulsions and froths. Surface and interfacial tensions, adsorption and film-formation are all irrelevant: the decisive factor is a curious and novel physical property of the phases, their "breaking length." An extraordinary feature of the book are the illustrations—half-tones of more than 1300 tubes and bottles containing soap solutions which, at their worst, convey nothing and, at their best, no more than the text. They may in part account for the high price of the book, which is difficult to explain on any other grounds.

Commercial Metallurgy.

The Metallurgy of the Common Metals: Gold, Silver, Iron (and Steel), Copper, Lead, and Zinc. By L. S. Austin. Fifth edition, revised and enlarged. Pp. xviii+615. (New York: J. Wiley and Sons, Inc. London: Chapman and Hall, Ltd., 1921.) 42s. net.

THE first edition of Prof. Austin's book was published in 1907—it has now reached a fifth edition. In his preface the author states that since 1913, the date of the last edition, such radical changes and improvements have been made in the metallurgy of the common metals that the present book has been

largely rewritten to bring it in accord with present-day practice. It is refreshing to come across a book which treats metallurgy as a whole and does not, as is so frequently the case, subdivide it into the so-called ferrous and non-ferrous metallurgy. The practice of differentiating the metallurgy of iron and its alloys from that of the other metals has its origin, of course, in the outstanding practical importance of these materials and the scale on which they are manufactured, but there is no scientific reason for making any distinction of this kind, and indeed, there is little doubt that if there were more interchange of opinion between those engaged in the various metal industries it would be of considerable benefit to all concerned.

The first ten chapters deal with general metallurgy under the headings (1) ores and metals, (2) fuels, (3) refractories, (4) the preparation of ores, (5) crushing, grinding, screening, and classifying, (6) metallurgical furnaces, (7) combustion, (8) metallurgical thermochemistry, (9) roasting, and (10) concentration of ores. Inasmuch as these aspects of metallurgy are compressed into 117 pages, the treatment is necessarily somewhat brief. The author, however, has economised space in not attempting to describe methods not now in use. Compactly as the subjects are dealt with, it would appear that terseness has been carried to an extreme in attempting to describe the concentration of ores by gravity, by concentrating tables, and by oil flotation in three pages, a considerable part of which is occupied with diagrams.

The remainder of the book treats of the metallurgy of gold, silver, iron, copper, lead, and zinc in so far as extraction and refining processes are concerned. No attempt, however, is made to deal with the mechanical treatment of metals, either in the hot or cold state, nor their working up into finished products. One of the characteristic features of American metallurgy is its emphasis on the efficient mechanical handling of the materials used in producing the metals and it is natural, therefore, to find this aspect of the subject well treated. The author's account of the metallurgy of gold, silver, copper, and lead is, on the whole, satisfactory. The metal iron, however, receives something less than its share of credit, for an attempt is made to describe the production of wrought iron in less than three pages. To try to deal with the manufacture of wrought iron without any account of the mechanical treatment necessary, except in the most perfunctory fashion, is certainly unusual. With regard to zinc, it is somewhat curious that, considering the importance of the present-day production of electrolytic zinc, very little more than one page is devoted to it.

The last two chapters give a brief account of plant and equipment and their cost and the business of